

**S/N 09/393,463**

**PATENT**

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

Applicant: William S. Woods

Examiner: Lun Lao

Serial No.: 09/393,463

Group Art Unit: 2614

Filed: September 10, 1999

Docket No.: 899.009US1

Customer No.: 21186

Confirmation No.: 2759

Title: AUDIO SIGNAL PROCESSING

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**REPLY BRIEF UNDER 37 C.F.R. 41.41**

Mail Stop Appeal Brief - Patents  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

This Reply Brief is presented in response to the Examiner's Answer dated 17 April 2009. Appellant's Appeal Brief was filed 17 July 2007 in response to the rejections of claims 1-23, 25, 28-29, 34, 36, and 40 of the above-identified application, as set forth in the Final Office Action mailed November 15, 2006.

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**REPLY**

The Examiner's Answer dated April 17, 2009, differs from the Examiner's Answer of November 1, 2007 (vacated by the Board) only in that Section 6 identifies the rejections as "NEW GROUND(S) OF REJECTION." The arguments appear to be word-for-word the same. Thus, Appellant's Reply Brief Under 37 C.F.R. 41.41 submitted in response to the vacated Examiner's Answer is incorporated herein by reference, and the arguments set forth therein are repeated to respectfully request withdrawal of the rejections and allowance of the pending claims in this appeal.

A copy of Appellant's Reply Brief Under 37 C.F.R. 41.41 dated January 2, 2008 is submitted herewith for the convenience of the Board.

Conclusion

The pending claims subject to this appeal are believed patentable. Appellant respectfully submits the claims are in condition for allowance and requests the Board issue an order to withdraw the rejections of claims 1-23, 25, 28-29, 34, 36, and 40.

If necessary, please charge any additional fees or credit overpayment to Deposit Account 19-0743.

Respectfully submitted,

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Signature

**S/N 09/393,463**

**PATENT**

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

Applicant:	William S. Woods	Examiner:	Lun S. Lao
Serial No.:	09/393,463	Group Art Unit:	2615
Filed:	September 10, 1999	Docket:	899.009US1
Title:	AUDIO SIGNAL PROCESSING		

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**REPLY BRIEF UNDER 37 C.F.R. 41.41**

MS APPEAL BRIEF - PATENTS  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

This Reply Brief is presented in response to the Examiner's Answer dated 1 November 2007, sent in answer to Appellant's Appeal Brief filed 17 July 2007. Appellants' Appeal Brief was filed in response to the rejections of claims 1-23, 25, 28-29, 34, 36, and 40 of the above-identified application, as set forth in the Final Office Action mailed 22 January 2007.

## REPLY

### REMARKS

The Examiner's Answer Brief ("Examiner's Answer"), dated 1 November 2007, includes similar grounds for rejection as the last Final Office Action. Appellant respectfully maintains that the Appeal Brief, which is hereby incorporated by reference and reasserted in response, overcomes the original grounds of rejections.

### Comments by Appellant Relating to the Examiner's Answer

The Appellant has reviewed the Examiner's Answer, and believes the statements in the original Appeal Brief remain compelling. In responding to the Examiner's Answer, the Appellant wishes to further clarify certain points of distinction between the pending claims and the cited references in response to the presented Examiner comments. The corresponding pages of the Examiner's Answer will be used to reference each of these points.

In addition, Appellant maintains each argument submitted in Appellant's pending Appeal Brief, and respectfully submits that each of the arguments are proper and valid in view of all of the statements made in the Examiner's Answer. Therefore, any lack of reference in this Reply Brief to a particular argument in the pending Appeal Brief is not to be construed as an admission that the Appellant agrees with any of the statements in the Examiner's Answer. Appellant asks that the statements made in Appellant's pending Appeal Brief be considered in full, in addition to the statements included with this Reply Brief.

### ***Discussion of the rejection of claim 1 under 35 U.S.C. § 102(e) as being anticipated by Kandel (US 6,353,671).***

Regarding the Examiner's Answer with respect to the rejection of claim 1 under 35 USC § 102(e) as being anticipated by Kandel (US 6,353,671) (item 1 page 3 and pages 20-21 in the Response to Argument section), the Examiner's response apparently does not address the issue proffered by the Appellant in the Appeal Brief. The Appellant noted that a filter processing a

signal does not disclose, teach, or suggest adjusting a filter using a signal. Further, Appellant submitted that Kandel's filter 120 operating on a signal does not disclose, teach, or suggest using a signal to adjust Kandel's filter 120. In the response to argument, the Examiner on page 20 states "Kandel discloses a adjusting (such as, by processing filter 120 accurate the input signal (T tong signal plus the audio signal) from microphone 118 and output to mixer 113 when the T tong frequency changing) a feedback-inhibiting filter (120 in Fig. 4; column 5, line 57 to column 6, line 5; column 9, lines 50-57) using a narrowband subaudible probe signal (reads on the T tong signal, in Fig.4; column 6, lines 19-24; column 10, lines 12-25; column 12, 1-4). It meets the limitation recited in claim 1." First, Appellant does not completely understand this quote. Secondly, there is no explanation provided in the Examiner's Reply as to the reason that the Examiner alleges that "[i]t meets the limitation recited in claim 1." It appears that the above quote also supports the Appellant's position the Kandel's filter 120 operates on a signal. Further, Appellant cannot find in Kandel or in the Office Actions of record a reference or discussion regarding Kandel's filter 120 being adjustable using a signal. Thus, Appellant submits that Kandel does not anticipate claim 1 and that claim 1 is patentable over Kandel.

Appellant respectfully requests withdrawal of these rejections of claim 1 and allowance of this claim.

***Discussion of the rejection of claims 1-2, 5-15, 17-18, 20, 22, 25, 28-29, 34, 36, and 40 under 35 U.S.C. § 102(b) as being anticipated by Miller et al. (US 5,506,910), hereafter Miller.***  
**Claims 1, 36**

Regarding the Examiner's Answer with respect to the rejection of claim 1 under 35 USC § 102(e) as being anticipated by Miller, the Examiner's response apparently does not address the issue proffered by the Appellant in the Appeal Brief. With respect to claim 1, the Examiner states, beginning on page 21, "claim 1 . . . does not clearly specify in the claim how the narrowband subaudible probe signal is utilize to inhibit at least one feedback component, which the examiner can interpret broadly in a manner consistent with the specification." However, claim 1 does specify how the narrowband subaudible probe signal is utilized. Claim 1, in relevant part, recites "adjusting a feedback-inhibiting filter using a narrowband subaudible probe signal," that is a narrowband subaudible probe signal is used to adjust a feedback-inhibiting

filter. Thus, Appellant submits that the Examiner's analysis of claim 1 does not consider the features of claim 1 as arranged in claim 1.

In item 2 on page 4 and on pages 21 and 22 of the Answer, Miller's feedback eliminator 62 is referenced with respect to a feedback-inhibiting filter. In the Answer on page 21, the Examiner states "[r]egarding Figure 3, at column 7, lines 12-16, Miller, recites: The feedback eliminator 62 monitors the program signal from the mixer 24, identifies any frequencies which become loud because of acoustic feedback, and attenuates identified howl frequencies to eliminate the acoustic feedback." (This recitation from Miller also appears in the Examiner's explanation on page 22.) This statement demonstrates that Miller's feedback eliminator 62 operates on a signal but does not disclose or suggest that a signal is used to adjust Miller's feedback eliminator 62. Thus, Appellant submits that claim 1 is patentable over Miller. Since claim 36 includes the features of claim 1, Appellant submits that claim 36 is patentable over Miller for at least the reasons provided with respect to claim 1.

#### Claims 2, 5-7

Regarding claim 2, item 2 on page 4 and 23 of the Answer, it is stated "Miller discloses . . . a method of processing at least one audio signal comprising . . . to probe a feedback path (between 60 and 36 in fig. 3) having a second bandwidth (Figs. 1, 3 and 7-11; column 4, line 64 to column 5, line 35 and column 7, lines 9-19)." Column 4, line 64 to column 5, line 35 includes a discussion of "reference signals" used in Miller's method. The Examiner further expands on this quote on page 23 ending on page 24 by stating " . . . as shown in Fig. 3, which the signals from the feedback eliminator is fed to power amplifiers 34 in which speakers 36 broadcast the signal from power amplifiers 34. A microphone 40 to pick up the audio program, wherein the signal from the microphone is utilizes to make adjustments in the automatic equalizer. See Figs. 1 and 3; column 6, line 29 to column 7, line 20; column 11, lines 12-37. Therefore, Miller meets claim 2 as recited." However, as noted by the Examiner at the end of his discussion, the relevant path in the Miller method is from speakers 36 to microphone 40 and not "between 60 and 36" as alleged in the initial quotes from the Answer regarding claim 2. Miller's method as shown in his Figures 1 and 3 generates references signals from speakers 36 to reference signal pickup 40 to determine the signal being received by the audience. Miller at column 7, lines 5-8 recites "[t]he reference signal pickup 40 is located at the control center, or at a location near or in the audience,

to enable accurate pickup of the audio program being received by the audience.” Appellant submits that Miller’s methods test or probe a path to an audience, which does not disclose probing a feedback path. Though Miller takes into consideration feedback, canceling feedback does not disclose probing a feedback path. Thus, Appellant submits that Miller does not teach each and every claim element of claim 2 and/or Miller does not teach each and every claim element arranged as in claim 2. Thus, Appellant submits that claim 2 is patentable over Miller. Claims 5-7 depend from claim 2 and are patentable over Miller for at least the reasons stated with respect to claim 2.

Claims 8-15, 17-18, 20, 22, 25, 28-29, 34, and 40

Regarding claim 8, the Examiner states on page 24 of the Answer that “Miller further discloses that a system is configured to probe a feedback path with a narrowband subaudible probe signal (see Figs. 1 and 3-4, 7-11; column 6, lines 30-61, abstract).” This discussion also includes in the ending section an acknowledgement that the system is configured to send reference signals from speakers 36 to microphone 40. However, reference signal pickup 40 is configured to pickup the reference or test signals sending directly from speakers 36 “to enable accurate pickup of the audio program being received by the audience” (*See column 7, lines 5-8.*) Thus, Appellant submits that Miller’s system is configured to test or probe a direct path to an audience, which does not disclose a system configured to probe a feedback path with an audio probe signal. Though Miller takes into consideration feedback, components configured to cancel feedback does not disclose a system configured to probe a feedback path with an audio probe signal. Thus, Appellant submits that Miller does not teach each and every claim element of claim 8 and/or Miller does not teach each and every claim element arranged as in claim 8. Thus, Appellant submits that claim 8 is patentable over Miller. Independent claim 25 includes the features of claim 8 and is patentable over Miller for at least the reasons stated with respect to claim 8.

With respect to claim 40, the Examiner, at page 8 and at page 26 of the Answer, states “Miller discloses a filter adjuster (64 in fig. 3) to adjust an inhibiting filter (62 in fig. 3).” Appellant cannot find such a disclosure in the sections of Miller cited by the Examiner or elsewhere in Miller. Miller’s component 64 is a feedback eliminator that operates on a signal. Appellant finds no disclosure or suggestion that Miller’s feedback eliminator being adjusted as



alleged in the Answer. Claim 40 depends from claim 8 and is patentable over Miller for at least the reasons stated with respect to claim 8. Additionally claims 9-15, 17-18, 20, and 22, and claims 28-29, and 34 depend from claims 8 and 25, respectively, and are patentable over Miller for at least the reasons stated with respect to claim 8.

Appellant respectfully requests withdrawal of these rejections of claims 1-2, 5-15, 17-18, 20, 22, 25, 28-29, 34, 36, and 40 and allowance of these claims.

***Discussion of the rejection of claims 1-7 under 35 U.S.C. § 103(a) as being unpatentable over Finn et al. (US 6,496,581), hereafter Finn.***

**Claim 1**

Regarding the Examiner's Answer with respect to the rejection of claim 1 under 35 USC § 103(a) as being unpatentable over Finn, the Examiner's response apparently does not address the issue proffered by the Appellant in the Appeal Brief. Appellant noted that Finn's method, as proffered in the Office Actions of record, does not apply a narrowband subaudible signal as a probe signal. With respect to claim 1, the Examiner at item 3 on page 8 has referenced Finn's figure 8 and associated disclosure in column 15, lines 17-36 with its use of a tone generator in a feedback tonal canceler 390. At page 27, the Examiner states that "the system of Finn operates in a similar manner to Appellant's invention to suppression feedback of the input signal." Appellant submits that this statement is incorrect. At column 15, lines 17-27, Finn recites "[i]n FIG. 8, an acoustic feedback tonal canceler 390 removes tonal feedback noise from the output of microphone 36 to prevent broadcast thereof by loudspeaker 34. Feedback tonal canceler 390 includes a summer 392 having an input 394 from microphone 36, an input 396 from feedback detector 398 and tone generator 400 supplied through adaptive filter model 402, and an output 404 to loudspeaker 34 through summer 90. Model 402 has a model input 406 from tone generator 400, a model output 408 supplying a correction signal to summer input 396, and an error input 410 from summer output 404." From this section of Finn, it is clear that Finn's apparatus operates by generating a cancelling signal to eliminate feedback by forming a corrective signal using a tone generator, but does not generate a probe signal. The cited section, column 15, lines 17-36 of Finn, notes that signal 406 provides a model input to model 402 and that signal 436 provides a model input to model 432. Finn does not teach or suggest that the

signals 406, 436 from tone generators 400 and 430, respectively, provide a probing function. As a result, Finn does not teach or suggest a subaudible narrowband probe signal used to adjust an inhibiting filter as recited in claim 1.

Since Finn's method does not include use of a probe signal, Appellant submits that Finn does not teach or suggest all the elements of claim 1. Further, the discussions in the Office Actions of record do not provide a basis for assuming that the missing elements are obvious. Considering claim 1 as a whole and the differences between claim 1 and Finn, Appellant submits that claim 1 is patentable over Finn.

#### Claims 2-7

Regarding the Examiner's Answer with respect to the rejection of claim 2 under 35 USC § 103(a) as being unpatentable over Finn, the Examiner's response apparently does not address the issue proffered by the Appellant in the Appeal Brief. Appellant noted that Finn's method, as proffered in the Office Actions of record, does not apply a narrowband subaudible signal to form a probe signal to probe a feedback path, that is, Finn's method does not include a probing function.

At item 3 page 9, the Examiner noted that "Finn further discloses an acoustic feedback tonal canceler is provided, removing tonal noise from the output of the microphone to prevent broadcast thereof by a remote but acoustically coupled loudspeaker." Finn's tonal canceler, as noted above, "includes a summer 392 having an input 394 from microphone 36, an input 396 from feedback detector 398 and tone generator 400 supplied through adaptive filter model 402, and an output 404 to loudspeaker 34 through summer 90," which cancels tonal feedback prior to broadcast by the speaker. Operation of such an apparatus does not disclose or suggest sending a narrowband subaudible signal to form a probe signal to probe a feedback path. Finn does not appear to disclose or suggest use of a probing signal to probe a feedback path.

At page 10, the Examiner states "it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Finn with the teaching of Finn to incorporate an acoustic feedback tonal canceler in order to removing tonal noise from the output of the microphone to prevent broadcast thereof by a remote but acoustically Coupled loudspeaker." Appellant does not completely understand this quote. Finn at column 15, lines 17-29 recites: "[i]n FIG. 8, an acoustic feedback tonal canceler 390 removes tonal feedback noise

from the output of microphone 36 to prevent broadcast thereof by loudspeaker 34 . . . A second feedback tonal canceler 420 is comparable to feedback tonal canceler 390.” The second feedback tonal canceler 420 provides input to a remote but acoustically coupled loudspeaker 32. Secondly, the quote from the Answer does not provide an explanation as to how Finn allegedly discloses or makes obvious sending a narrowband subaudible signal to form a probe signal to probe a feedback path as recited in claim 2.

Considering claim 2 as a whole and the differences between claim 2 and Finn, Appellant submits that claim 2 is patentable over Finn. Claims 3-7 depend from claim 2 and are patentable over Finn for at least the reasons stated herein.

Appellant respectfully requests withdrawal of these rejections of claims 1-7 and allowance of these claims.

***Discussion of the rejection of claims 8-23, 25, 28-29, 34, 36, and 40 under 35 U.S.C. § 103(a) as being unpatentable over Finn et al. (US 6,496,581), hereafter Finn, in view of Seki et al. (US 5,677,987), hereafter Seki.***

Regarding the Examiner's Answer with respect to the rejection of claim 8 under 35 USC § 103(a) as being unpatentable over Finn, the Examiner's response apparently does not address the issue proffered by the Appellant in the Appeal Brief. Appellant noted that the combination of Finn and Seki, as proffered in the Office Actions of record, does not disclose or suggest a system configured to generate a probe signal to probe a feedback path with a narrow band subaudible audio probe signal. In the Answer at item 4 on page 13, the Examiner states “Finn does not expressly disclose at least one probe generator to generate a probe signal and the filtered signal used to probe a feedback path with a narrowband audio narrowband subaudible probe signal.” Appellant cannot find an explanation or a reason provided in the Office Actions regarding a probe generator configured to generate a probe signal, a system configured to probe a feedback path, or a system configured to provide a narrowband subaudible audio probe signal with respect to Finn in view of Seki. The Office Actions of record appear void of a reason that the probe features of the system of claim 8 are allegedly obvious. Appellant submits that the statement on page 14 of the Answer that “it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Finn with the teaching of Finn to incorporate an

acoustic feedback tonal canceler in order to removing tonal noise from the output of the microphone to prevent broadcast thereof by a remote but acoustically coupled loudspeaker” does not address the features of claim 8 missing from Finn. Seki has been referenced stating that “Seki discloses a compressor/limiter for limiting the amplitude an input signal in order to avoid damaging equipment such as speaker.” Appellant submits that combining Seki with Finn, as proffered by the Examiner, does not cure the deficiencies of citing Finn with respect to claim 8. Thus, Appellant submits that the Answer does not provide a reason to base a finding of obviousness given that Finn in view of Seki does not teach or suggest all the elements of claim 8. Considering claim 8 as a whole and the differences between claim 8 and Finn in view of Seki, Appellant submits that claim 8 is patentable over Finn in view of Seki.

Seki has been referenced stating that “Seki discloses a compressor/limiter for limiting the amplitude an input signal in order to avoid damaging equipment such as speaker.” Appellant submits that combining Seki with Finn, as proffered by the Examiner, does not cure the deficiencies of citing Finn with respect to claim 1 for at least the reasons discussed above. Therefore, Appellant submits that claim 1 is patentable over Finn in view of Seki. Independent claim 36 is a method claim that includes the features of claim 1. Thus, Appellant submits that claim 36 is patentable over Finn in view of Seki.

Independent claim 25 includes the features of claim 8 and is patentable over Finn in view of Seki for at least the reasons stated with respect to claim 8. Additionally claims 9-23 and 40, and claims 28-29 and 34 depend from claims 8 and 25, respectively, and are patentable over Finn in view of Seki for at least the reasons stated with respect to claim 8.

Appellant respectfully requests withdrawal of these rejections of claims 8-23, 25, 28-29, 34, 36, and 40, and allowance of these claims.

***Discussion of the rejection of claim 1 under 35 U.S.C. § 103(a) as being unpatentable over Stott et al. (US 2002/0044667 9), hereafter Sttot, where, in the Examiner’s answer, claim 1 is rejected under 35 U.S.C. § 103(a) as being unpatentable over US 2002/00446679 to Stott et al. in view of Patent No. 5,506,910 to Miller.***

Regarding the Examiner’s Answer with respect to the rejection of claim 1 under 35 USC § 103(a) as being unpatentable over U.S. Patent Application Publication No. 20020044667 to

Stott et al., the Examiner's response apparently does not address the issue proffered by the Appellant in the Appeal Brief. The Appellant noted that an auto-correlation function being substantially a delta function does not disclose or suggest that a signal having such an auto-correlation is narrowband. According to Stott at paragraphs [0133] and [134], "[i]n order for the auto-correlation function of the signal to be as close as possible to a delta function,  $X(f)$  should be as flat as possible across the frequency spectrum," which demonstrates that the signal is broadband. Thus, Appellant submits that Stott teaches using a broadband signal, which teaches away from using a narrowband signal.

In item 5 beginning on page 19, the Examiner states "Stott discloses ... adjusting a feedback-inhibiting filter (76 in Fig. 7; page 3, paragraph 0047-0053) using a narrowband probe signal (70) (abstract; Fig 7)." The Abstract with reference to signal 70 recites "[t]he signal having an auto-correlation function which is substantially a delta function may be an added noise signal (70) or may be constituted by the signal being processed itself." Appellant submits that this statement, given Stott's disclosure in paragraphs [0133] and [134] that a signal having an auto-correlation function which is substantially a delta function is broadband, demonstrates that Stott uses a signal that is broadband in Stott's method to reduce the effect of feedback.

In the response to argument, the Examiner on page 28 states that "Miller et al. discloses a narrow band short duration low magnitude tones inserted into program signals being broadcast without distorting or producing any noticeable effect on the broadcast program (Figs. 1 and 3-4; column 2, lines 46-58). It is the combination that meets the claimed limitation." However, Appellant submits that this combination is a new grounds for rejection of claim 1, which is improper in that Stott relates to use of a broadband signal (as demonstrated above) which would be negated by use of Miller's alleged narrow band signal. Appellant also notes the Miller does not disclose or suggest a narrowband subaudible probe signal.

With respect to the Stott reference, the Examiner on page 28 continues from a discussion of Miller to state "the system of Finn operates in a similar manner to Appellant's invention to suppression feedback of the input signal. It is implicit that the tone generator of Finn as modified generates a narrowband tone signal, therefore Finn as modified discloses using a narrowband tone signal." No discussion is provided in the Examiner's Answer as to how the Examiner considers Stott and Finn related to each other.

Appellant respectfully submits that claim 1 is novel and non-obvious with respect to Sttot and with respect to Sttot in view of Miller and that claim 1 is patentable over Sttot and over Sttot in view of Miller. Appellant respectfully requests withdrawal of these rejections of claim 1 and allowance of this claim.

Conclusion

The pending claims subject to this appeal are believed patentable. Appellant respectfully submits the claims are in condition for allowance and requests the Board issue an order to withdraw the rejections of claims 1-23, 25, 28-29, 34, 36, and 40 and to issue a patent with claims 1-69.

If necessary, please charge any additional fees or credit overpayment to Deposit Account No. 19-0743.

Respectfully submitted,

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**CERTIFICATE UNDER 37 CFR 1.8:** The undersigned hereby certifies that this correspondence is being filed using the USPTO's electronic filing system EFS-Web, and is addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on this 2nd day of January 2008.

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